Puerto Rico
Science, Technology
& Research Trust

Eng. Lucy Crespo

Importance of STEM and CS in Puerto Rico

3/7/2018

For additional information: info@prsciencetrust.org

PUERTO RICO SCIENCE TECHNOLOGY AND RESEARCH TRUST

Who we are

We are a private non-profit organization created in 2004 to encourage and promote innovation, transfer and commercialization of technology and creation of jobs in the technology sector. We are responsible for Puerto Rico's public policy for science, technology, research and development.

Our mission

We invest, facilitate and build capacity to continually advance Puerto Rico's economy and its citizens' well-being through innovation-driven enterprises, science and technology and its industrial base.

Our vision

By 2022, Puerto Rico is a globally recognized innovation hub that develops, attracts, and retains scientists, technology entrepreneurs, and enterprises to unlock world class creativity and competitiveness

Our initiatives

Puerto Rico Center for Tropical Biodiversity & Bioprospecting

PR RESEARCH & INNOVATION Meetup

TTO TECHNOLOGY TRANSFER OFFICE

Puerto Rico Consortium of Clinical Investigation

P 1 8

Colmena 66
Tu Conexión Empresarial.

Puerto Rico Brain Trust for Tropical Diseases Research & Prevention

RESEARCH GRANTS PROGRAM

Cultural Heritage Innovation Program

Unidad de Control de Vectores de Puerto Rico

IMPORTANCE OF STEM AND CS IN PUERTO RICO

Objective : We need to inspire and educate the next generations of young women and girls to become STEM professionals

Approach: Sharing the Women in STEM : 2017 Update by *U.S. Department of Commerce Economics and Statistics Administration Office of the Chief Economist*

Call to action: To achieve success we must enable change in…

- Education programs
- Employment work environment
- Role modeling and Mentorship
- Life Experiences

WOMEN IN STEM: 2017 UPDATE

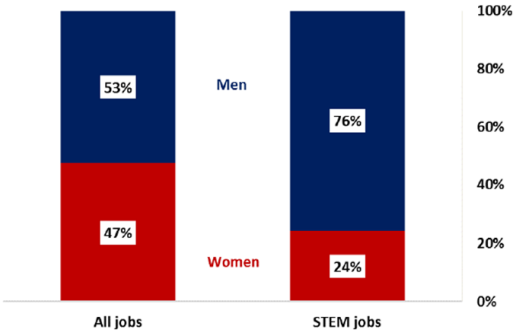
KEY FINDINGS WOMEN IN STEM: 2017 UPDATE

- Women filled 47 percent of all U.S. jobs in 2015 but held only 24 percent of STEM jobs.
- Women constitute slightly more than half of college educated workers but make up only 25 percent of college educated STEM workers.
- Women with STEM jobs earned 35 percent more than comparable women in non-STEM jobs — even higher than the 30 percent STEM premium for men. As a result, the gender wage gap is smaller in STEM jobs than in non-STEM jobs.
- Women with STEM jobs also earned 40 percent more than men with non-STEM jobs.

KEY FINDINGS WOMEN IN STEM: 2017 UPDATE

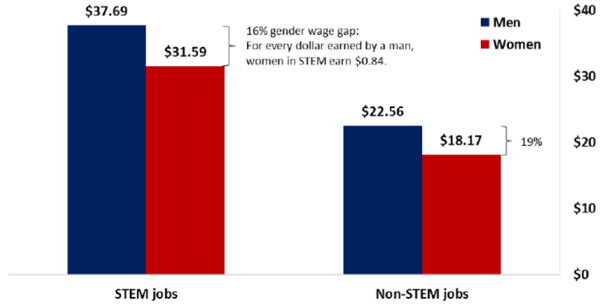
- While nearly as many women hold undergraduate degrees as men overall, they make up only about 30 percent of all STEM degree holders.
- Women make up a disproportionately low share of degree holders in all STEM fields, particularly engineering.
- Women with STEM degrees are less likely than their male counterparts to work in a STEM occupation; they are more likely to work in education or healthcare.
- Little Change from 2009 report

Figure 1. Gender Shares of Total and STEM Jobs, 2015



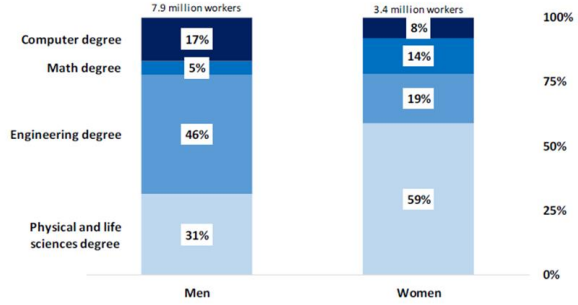
Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for employed persons age 16 and over.

Figure 3. Average Hourly Earnings by Gender and Type of Occupation, 2015



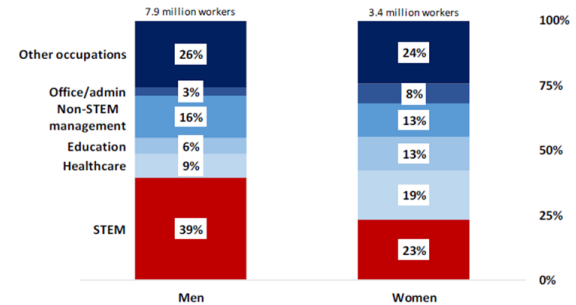
Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for full-time, year-round wage and salary workers age 16 and over.

Figure 5. College-educated Workers with a STEM Degree by Gender and STEM Degree Field, 2015



Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for employed persons age 25 and over. The shares for men do not add to 100% due to rounding.

FIgure 6. College-educated Workers with a STEM Degree by Gender and STEM Occupation, 2015



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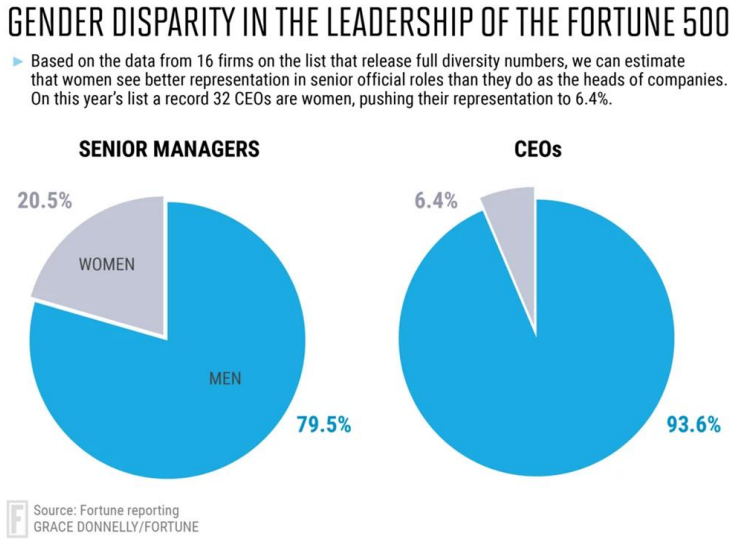
FORTUNE 500 COMPANIES



In the Fortune 500 women make up :

- *17.4% of the Chief Information Technology Officers (CIO)*
- *11.4% of Chief Financial Officers (CFO)*
- *6.4 % of Chief Executive Officers (CEO)*

- Five of the top 10 companies on the list have female CEO
- Fortune list have female CIOs (WalMart, ExxonMobil, Ford Motor, GE and Valero Energy)
- 24% of the top 100 companies have female CIOs
- Top industries for female CIOs across the Fortune 500 are Financial Services (13), Energy (12) and Manufacturing (12)
- Four major airlines (United
- Continental Holdings, Delta Air
- Lines, American Airlines Group and Alaska Air Group) have female CIOs

WOMEN IN THE PUERTO RICO LABOR FORCE

- In 2015 Women represented 42% of the Labor Force up from 31% in 1970
- Women participation in Labor Force Participation Rate was 31.9 % in 2015 (males were 49.2% down from 70% in 1970) **This rate is less than half in Canada, Spain, USA, and Colombia**
- From the 307,000 new positions created between 1970 to 2015, 71% are held by women.
- **Profile**

  49% married

  78% are between 24-54 years old

  49% have a bachelor or higher degree
- Salary gap is Puerto Rico is minimum only 2% (last study 2008)

WOMEN IN THE PUERTO RICO LABOR FORCE

- Sectors with higher representation are: Services (38.2%), Public Administration (24.3%) and Commerce (23.8%)
- From the last ten year the growth rate for women in management positions was reduced from 3.2% to -2.1%
- Women at the C Level increase from 5 % (2010) to 7.8% (2015) higher than USA 4.8%
- In the last election women representation decreased in Senate and Chamber of Representatives. Now we have 2 more mayors and 60% of the new cabinet members are female.
- 60% of the leaders for NGOs in Puerto Rico are women .

Source: Industrial Women 2016 International Conference **Mujer y Desarrollo**
Lcda. Anitza María Cox Marrero Directora Área de Análisis y Política Social, EstudiosTécnicos, Inc.

PRITI (PRIMER ESTUDIO DE LA INDUSTRIA DE INFORMÁTICA DE PUERTO RICO) NOVEMBER 2014

–55 Information Technology Companies

–Workforce reflected on study 2920 - 38% Women (higher than US percentage)

–Annual Internship 235 (35% regular job offers)

–Average Annual Salary $41K

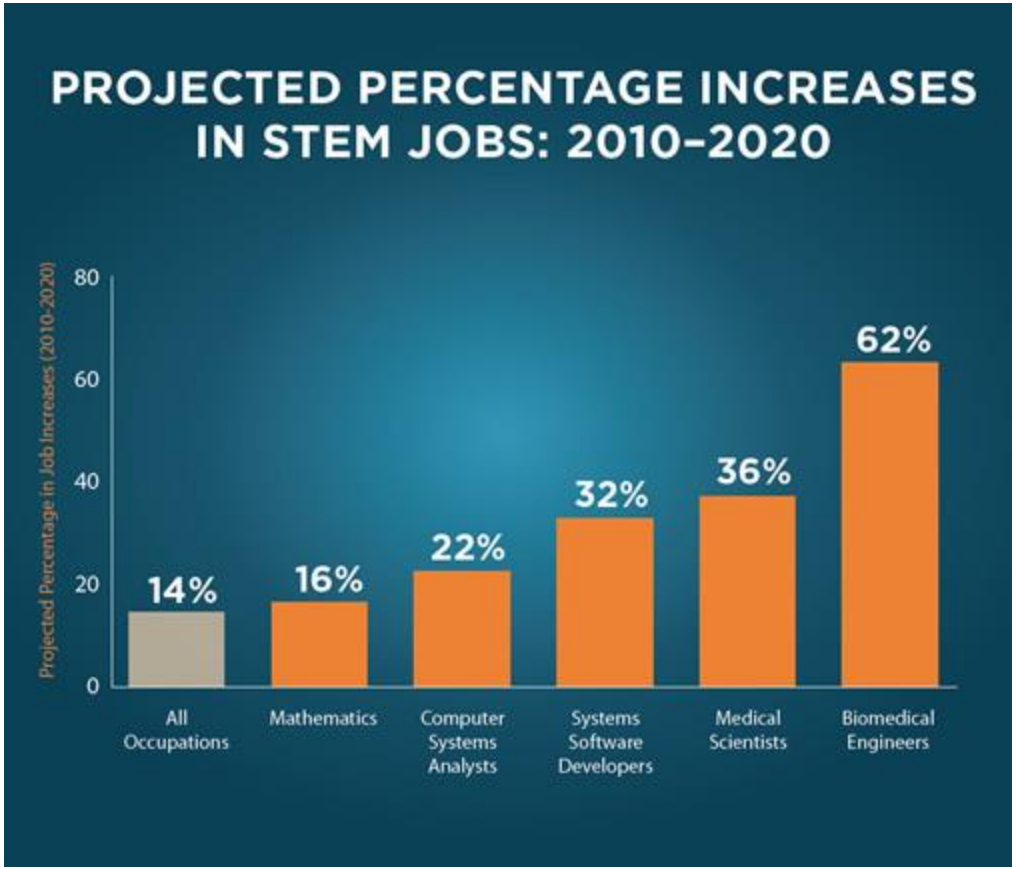
–Productivity = $350K

–CAGR % 2-3% per year

–Value of IT services : $1023M

–22% Exports

–11 new companies started since 2006



U.S. Bureau of Labor Statistics (BLS)

- Employment in occupations related to STEM—science, technology, engineering, and mathematics—is projected to grow to more than 9 million between 2012 and 2022.
- That's an increase of about 1 million jobs over 2012 employment levels.

TO ACHIEVE SUCCESS WE MUST ENABLE CHANGE IN…

Education programs

- Girls need to love STEM, Information Technology, and Computing

Employment work environment

- Create an inclusive corporate culture. Programs target to specifically increase C- Suite representation.
- Develop flexible work options and professional development tracks

Mentorship and Role Model

- Mentor two years older than Mentee
- Outreach from STEM Universities

TO ACHIEVE SUCCESS WE MUST ENABLE CHANGE IN…

Enhance Life Experiences :

- **I**nformation to girls about engineering and other STEM disciplines, because many don't know what these fields are really about.

- **De**monstration of what real STEM professionals do every day by telling the girls about what we have done.

- **A**ctivation girls need to get a hands-on feel for what STEM really is by creating fun and creative activities for them to participate in.

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Complete Figure Set
Women in STEM: 2017 Update
U.S. Department of Commerce Economics and Statistics Administration Office of the Chief Economist

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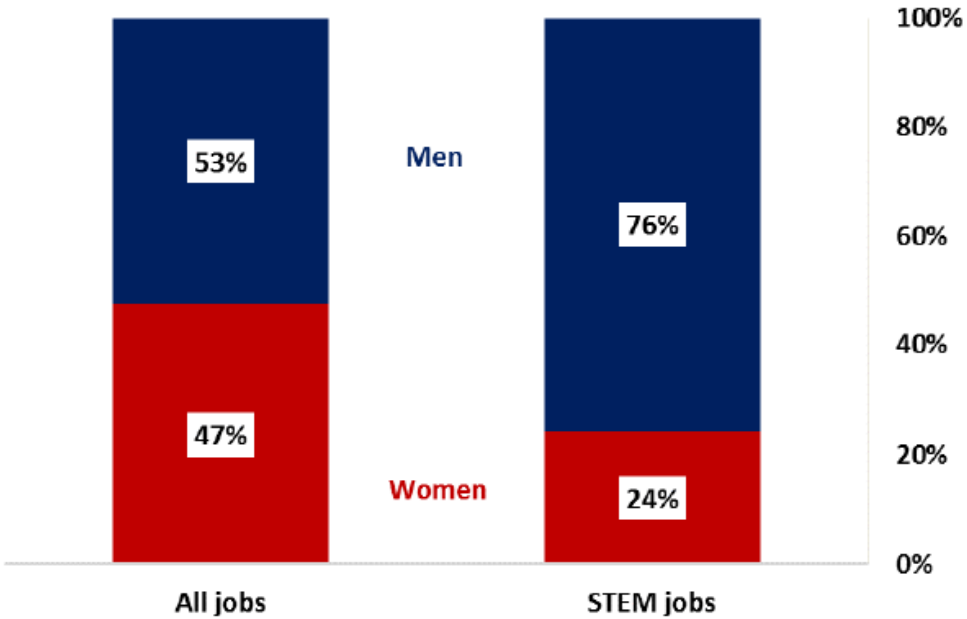
Figure 1. Gender Shares of Total and STEM Jobs, 2015



Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for employed persons age 16 and over.

Table 1. Total and STEM Employment by Gender and Educational Attainment, 2009 and 2015

(thousands of workers)

	Male		Female		Percent Female	
	2009	2015	2009	2015	2009	2015
All workers	73,580	79,067	67,058	71,506	48%	47%
College-educated	22,167	24,991	21,433	25,431	49%	50%
STEM workers	5,640	6,520	1,790	2,100	24%	24%
College-educated	3,259	4,469	1,199	1,497	24%	25%

Source: OCE calculations from Census 2009 and 2015 American Community Survey public-use microdata.

Note: Estimates are for employed persons age 16 and over. College-educated workers are those with at least a bachelor's degree.

Table 2. Employment in STEM Occupations, 2009 and 2015

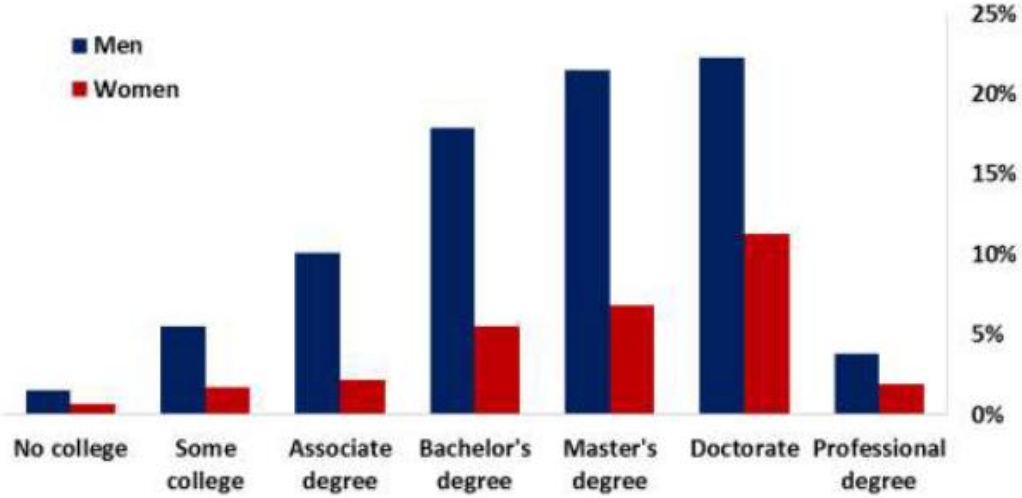
(thousands of workers)

	Male		Female		Percent Female	
	2009	2015	2009	2015	2009	2015
STEM total	***5,640***	***6,520***	***1,790***	***2,100***	***24%***	***24%***
Computer science and math	2,534	3,162	929	1,101	27%	26%
Engineering	2,079	2,195	330	364	14%	14%
Physical and life sciences	553	595	374	448	40%	43%
STEM managers	474	568	157	187	25%	25%

Source: OCE calculations from Census 2009 and 2015 American Community Survey public-use microdata.

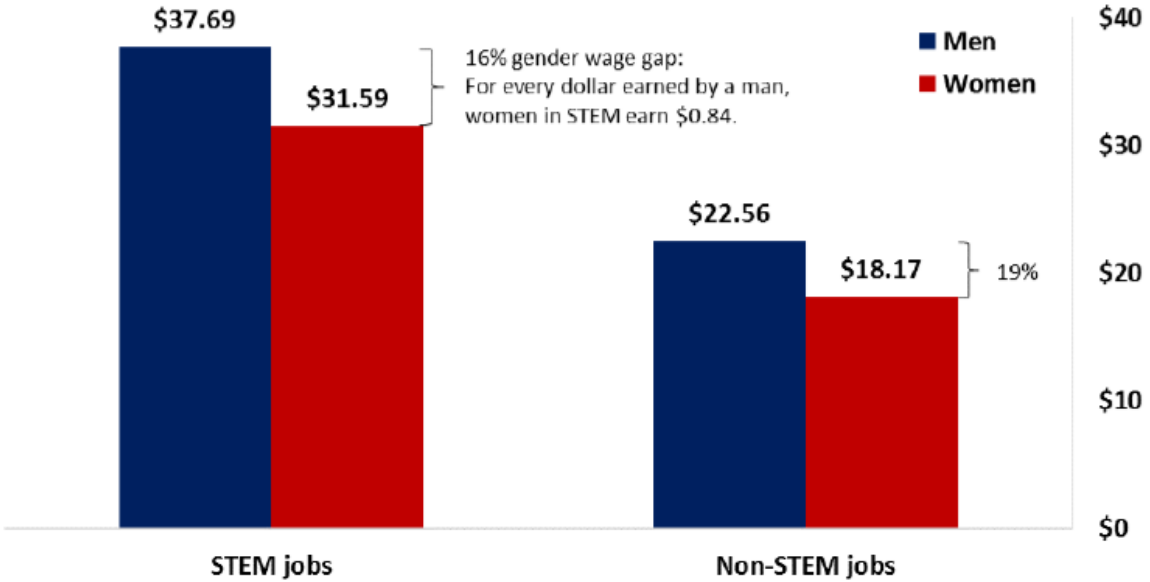
Note: Estimates are for employed persons age 16 and over.

Figure 2. Share of Workers in STEM Jobs by Gender and Educational Attainment, 2015



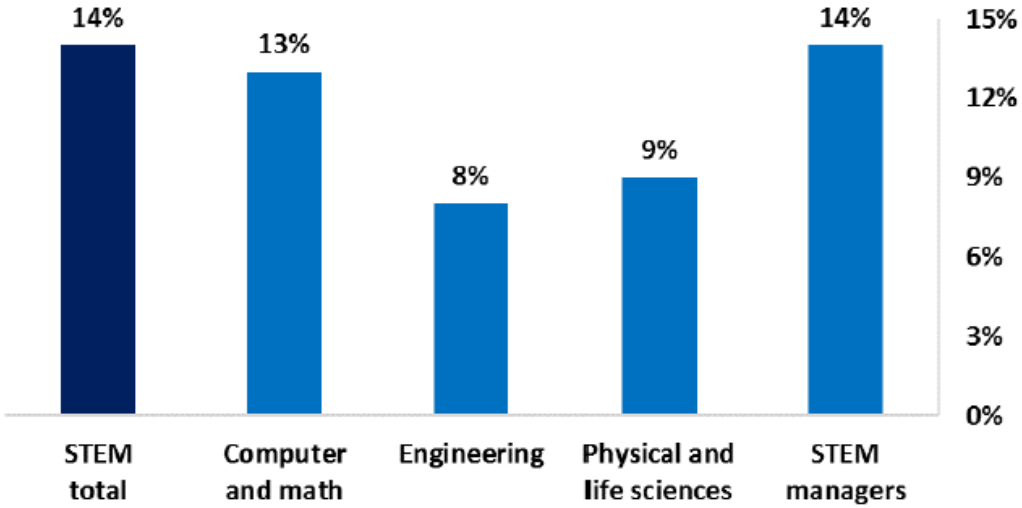
Source: OCE calculations using American Community Survey public-use microdata.
Note: Professional degrees include medical, dental, veterinary, and law degrees. Estimates are for employed persons age 16 and over.

Figure 3. Average Hourly Earnings by Gender and Type of Occupation, 2015



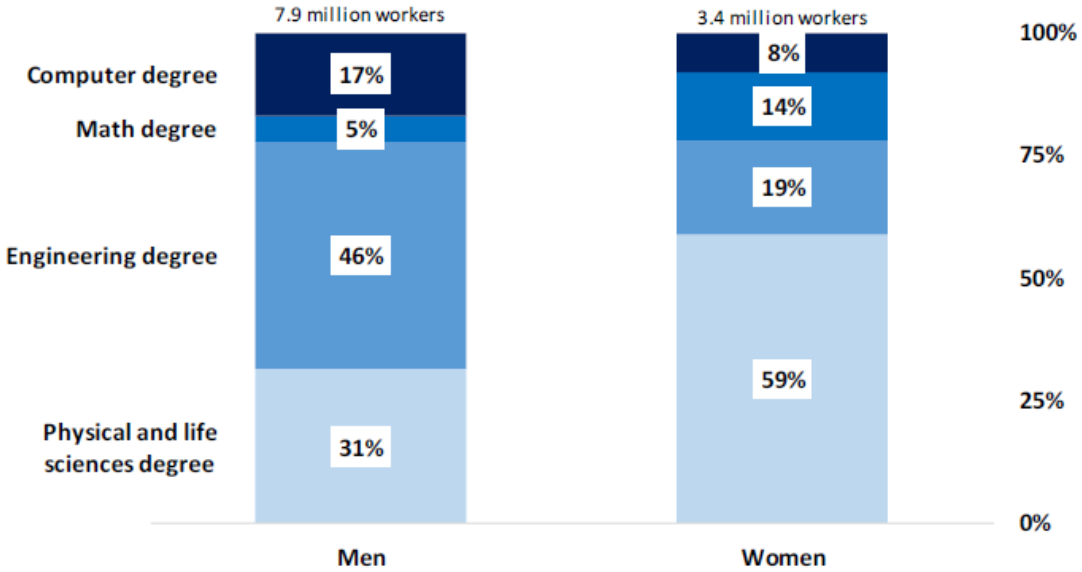
Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for full-time, year-round wage and salary workers age 16 and over.

Figure 4. Regression-adjusted Gender Wage Gap of College-educated STEM Workers by Occupation, 2015



Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for full-time, year-round private wage and salary workers age 25 and over.

Figure 5. College-educated Workers with a STEM Degree by Gender and STEM Degree Field, 2015



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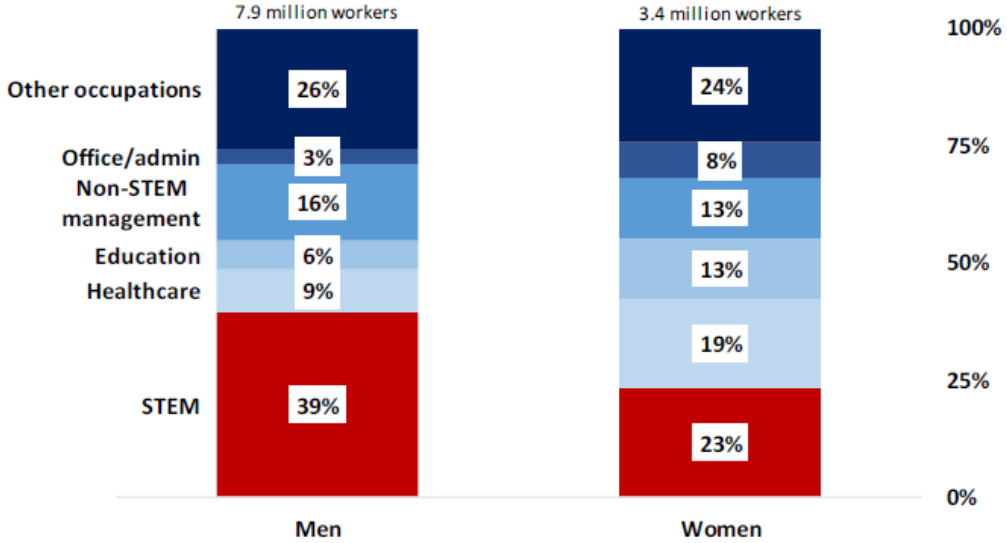
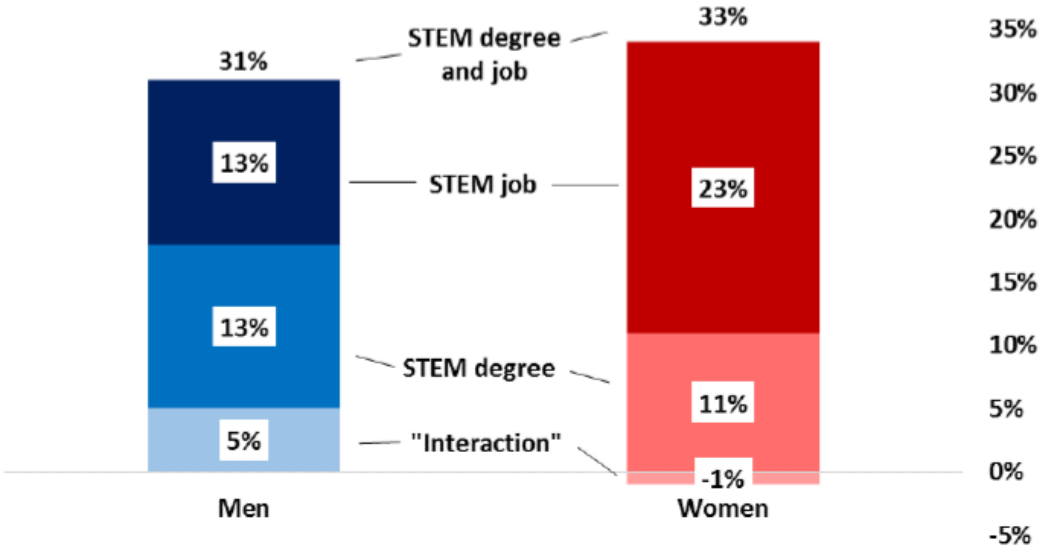


Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for employed persons age 25 and over. The shares for men do not add to 100% due to rounding.

Figure 7. Earnings Premium from Having a STEM Job and/or Degree, 2015

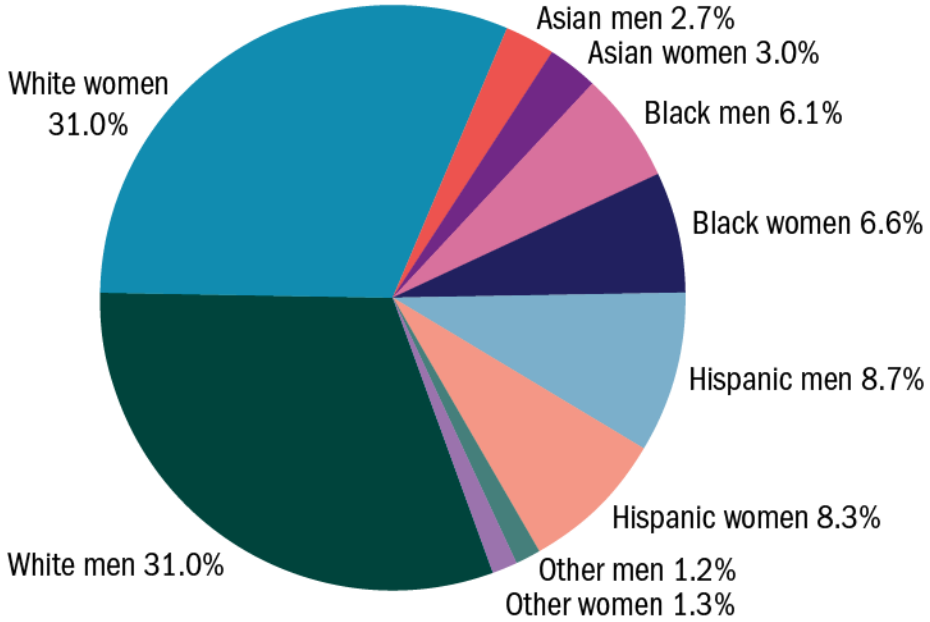


Source: OCE calculations using American Community Survey public-use microdata.
Note: Estimates are for full-time, year-round private wage and salary workers with at least a bachelor's degree who are age 25 and over.

SUMMARY 2017 WOMEN, MINORITIES, PERSONS WITH DISABILITIES IN SCIENCE AND ENGINEERING (NSF)

- Women, persons with disabilities, and three racial and ethnic groups—blacks, Hispanics, and American Indians or Alaska Natives—are underrepresented in S&E.
- Women have reached parity with men among S&E degree recipients overall, they constitute disproportionally smaller percentages of employed scientists and engineers than they do of the U.S. population.
- Blacks, Hispanics, and American Indians or Alaska Natives remain underrepresented in educational attainment and the S&E workforce.
- Asians are overrepresented among S&E degree recipients and employed scientists and engineers.

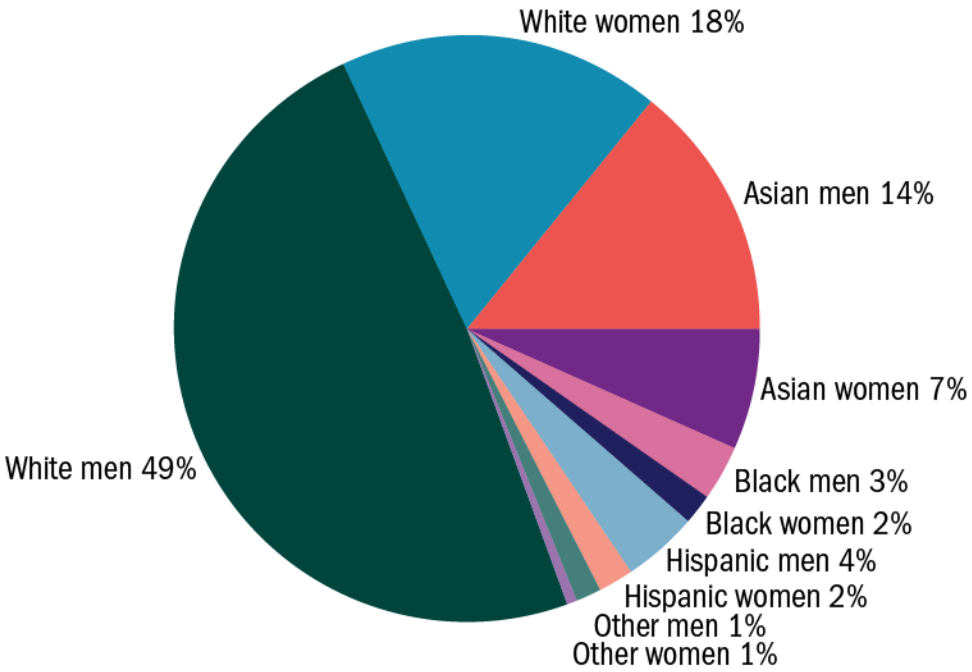
Noninstitutionalized resident population of the United States ages 18–64, by race, ethnicity, and sex: 2014



NOTES: Hispanic may be any race. Other includes individuals not of Hispanic ethnicity who reported more than one race or a race not listed separately.

Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Scientists and engineers working in science and engineering occupations: 2015

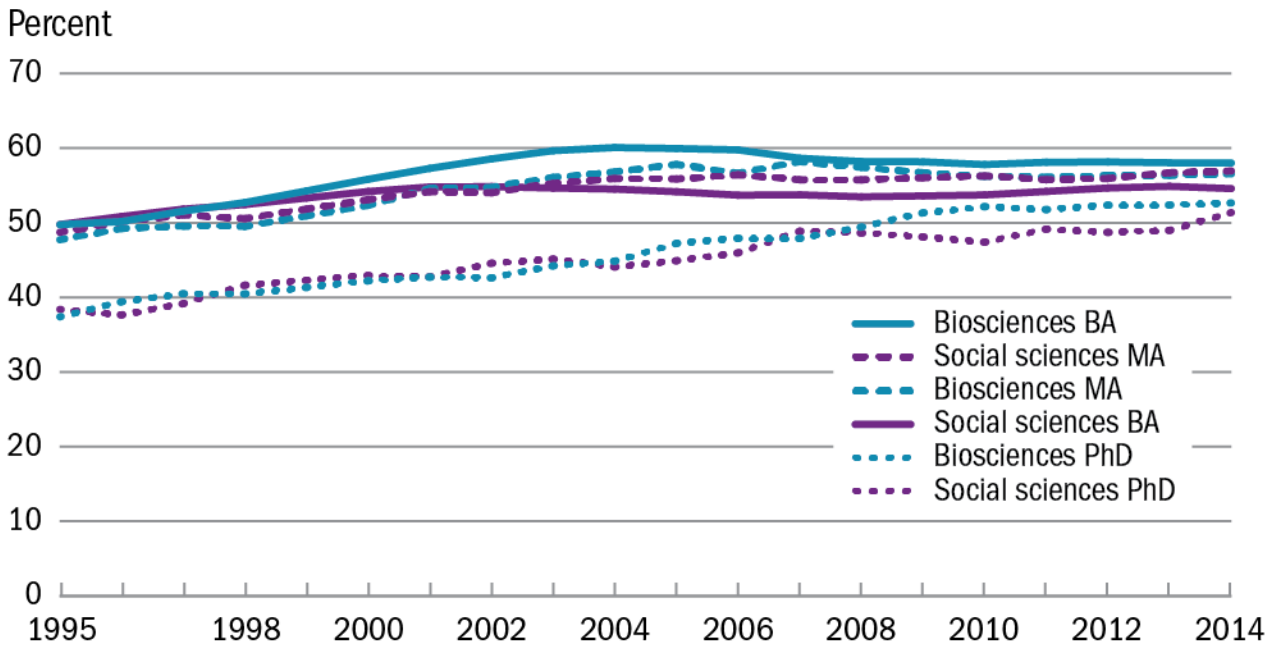


70% men
30% women

NOTES: Hispanic may be any race. Other includes American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, and multiple race.

Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

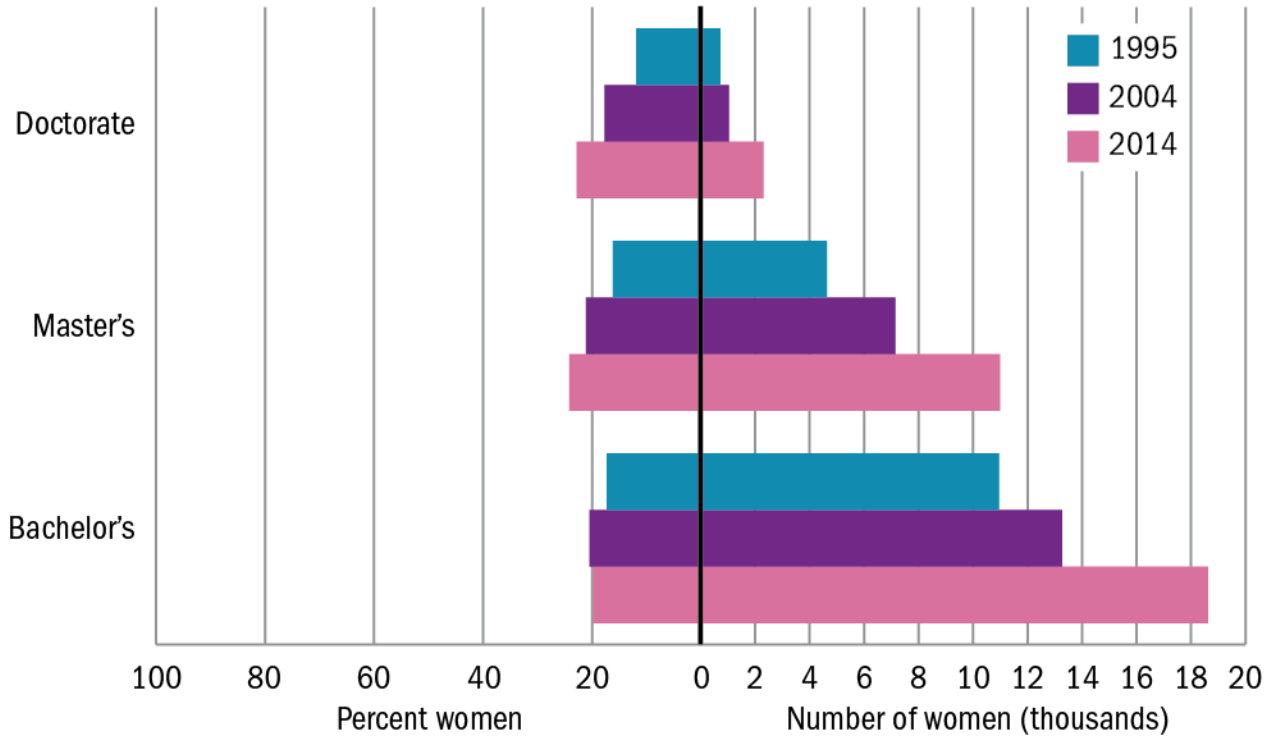
High participation fields for women: Biosciences and social sciences, 1995–2014



NOTE: Data not available for 1999.

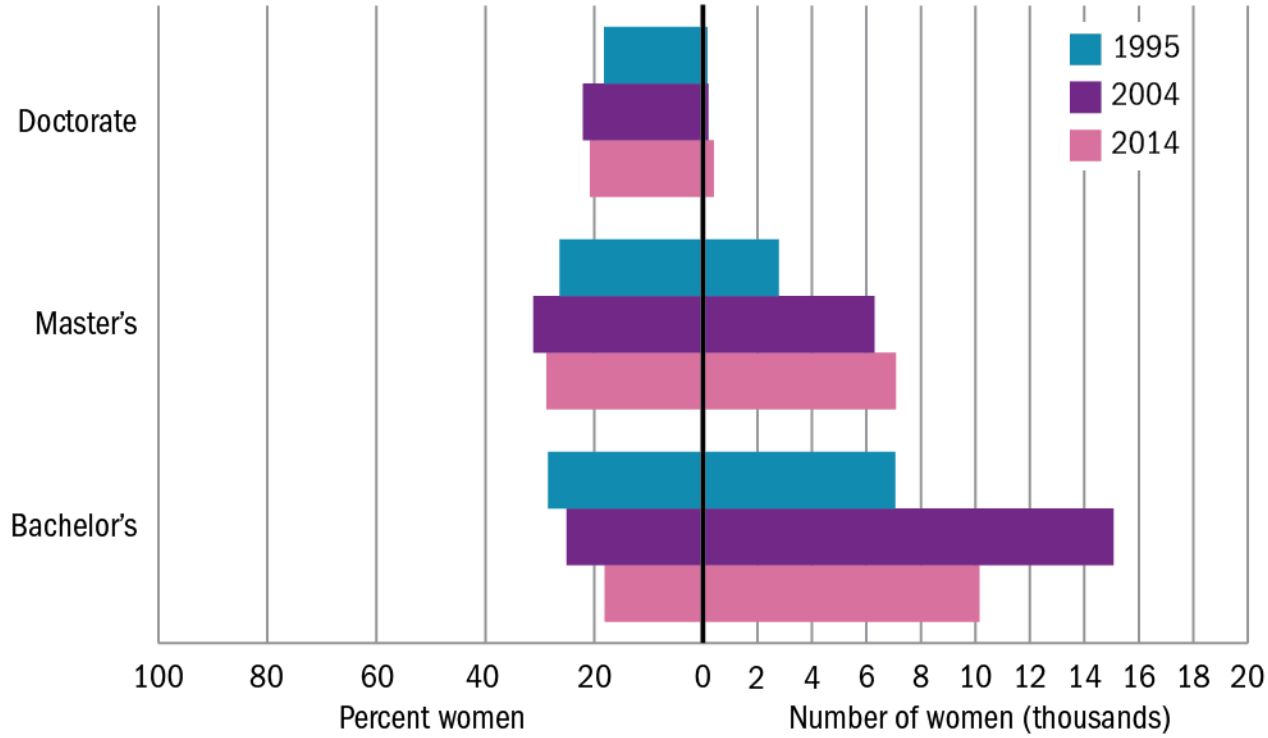
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Low participation field for women: Engineering, 1995, 2004, 2014



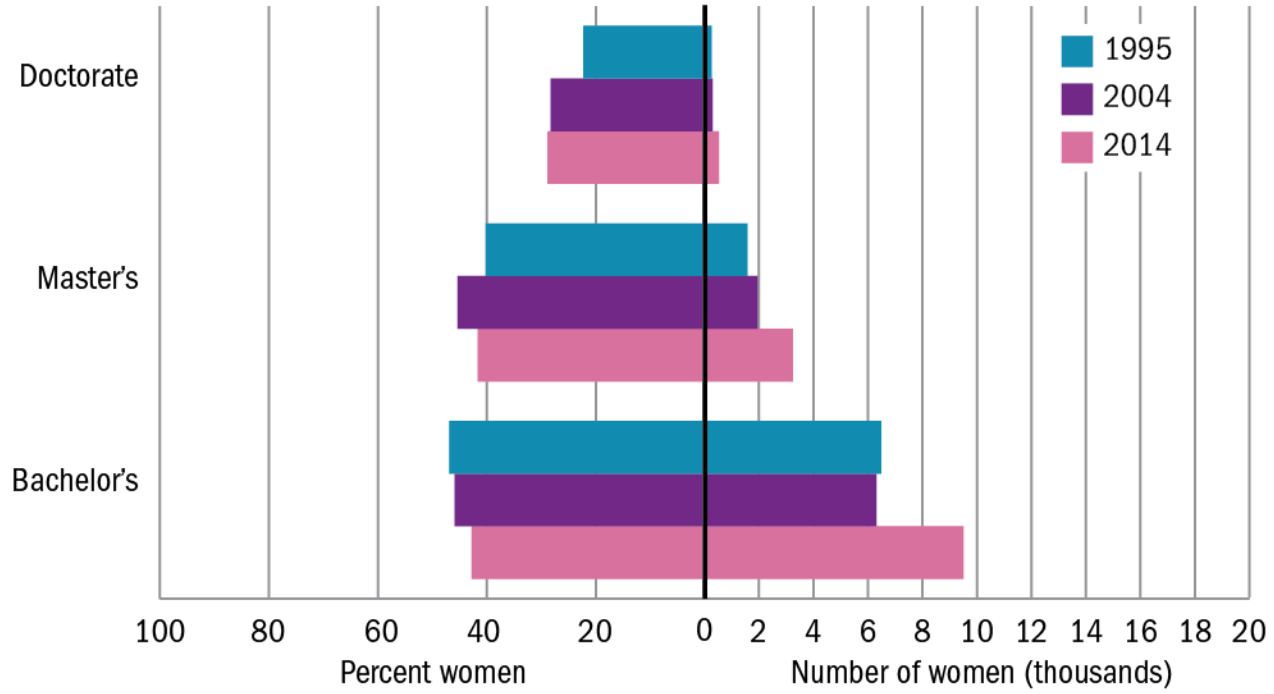
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Low participation field for women: Computer sciences, 1995, 2004, 2014



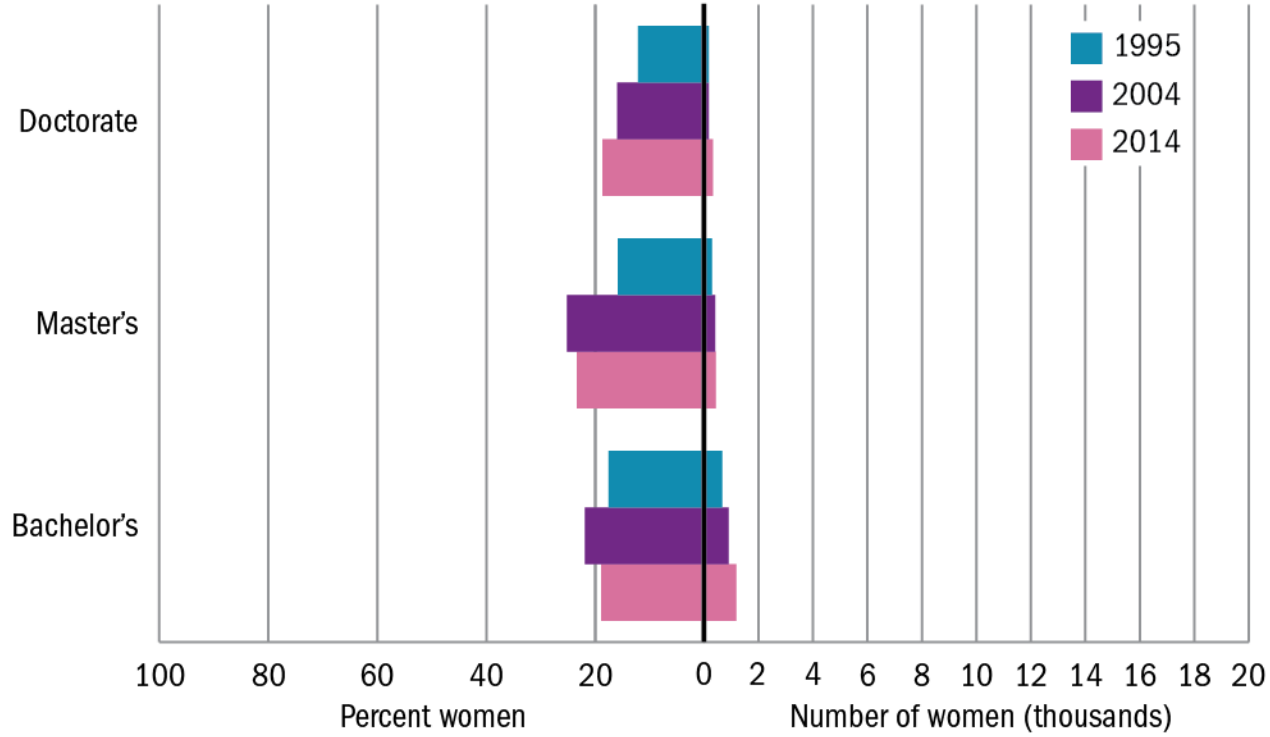
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Low participation field for women: Mathematics and statistics, 1995, 2004, 2014



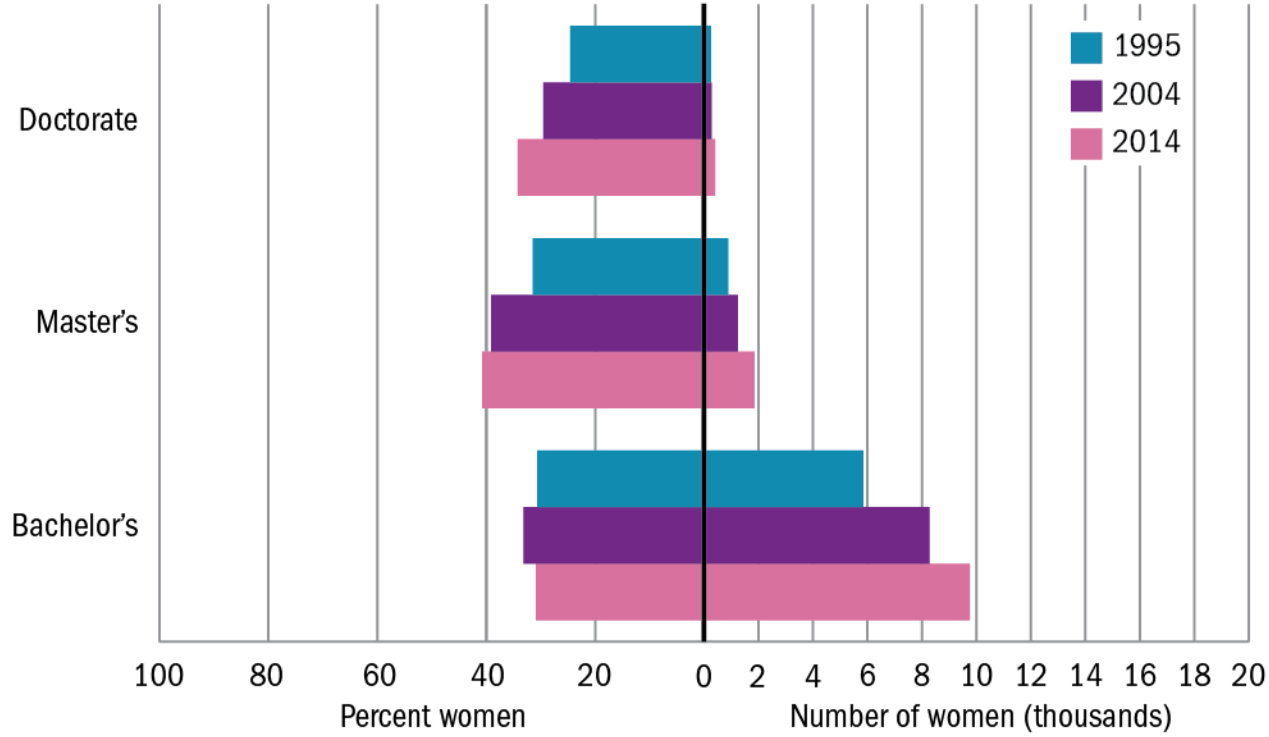
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Low participation field for women: Physics, 1995, 2004, 2014



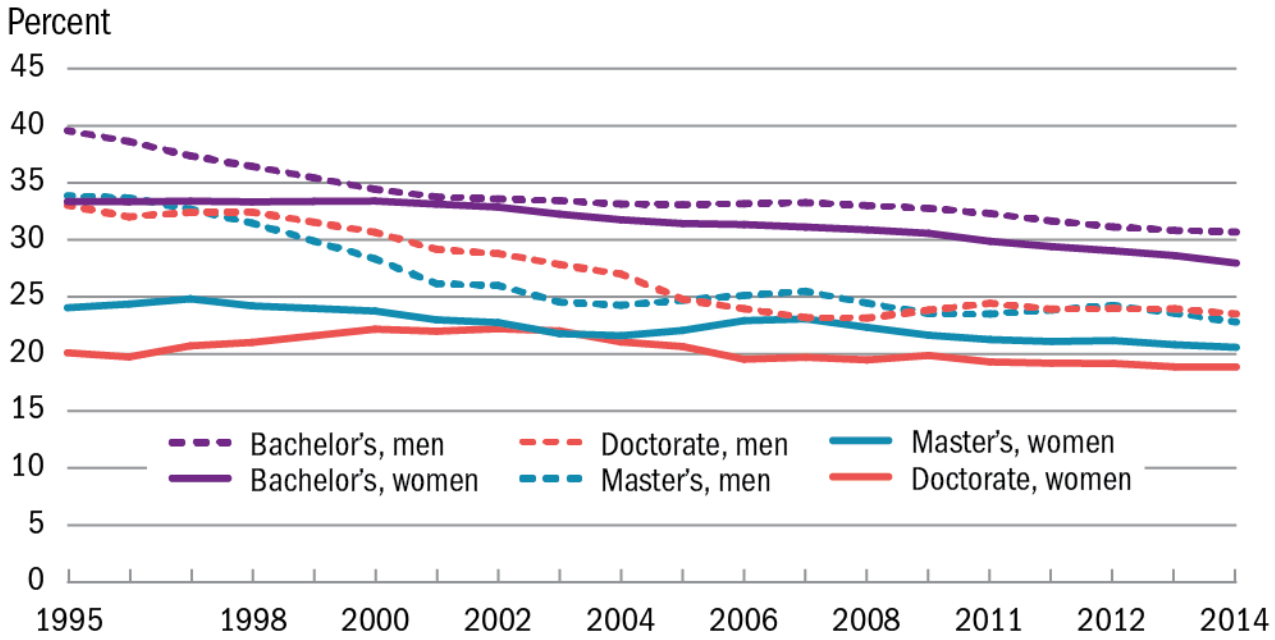
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Low participation field for women: Economics, 1995, 2004, 2014



Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

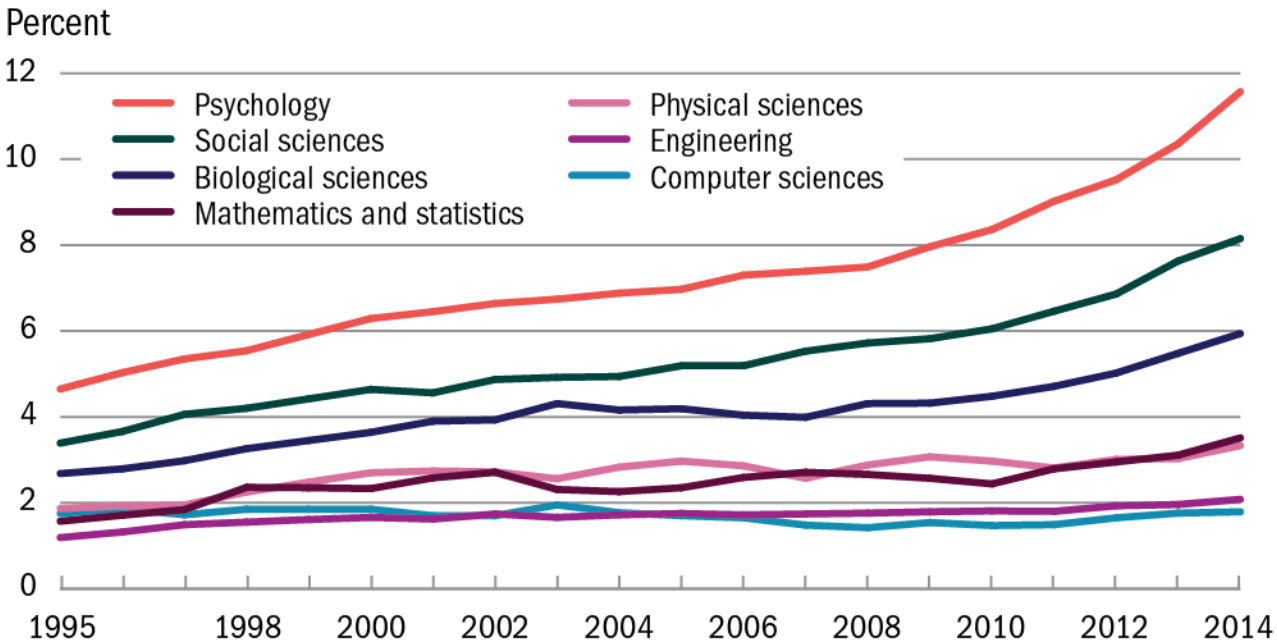
Science and engineering degrees earned by white women and men: 1995–2014



NOTE: Data not available for 1999.

Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

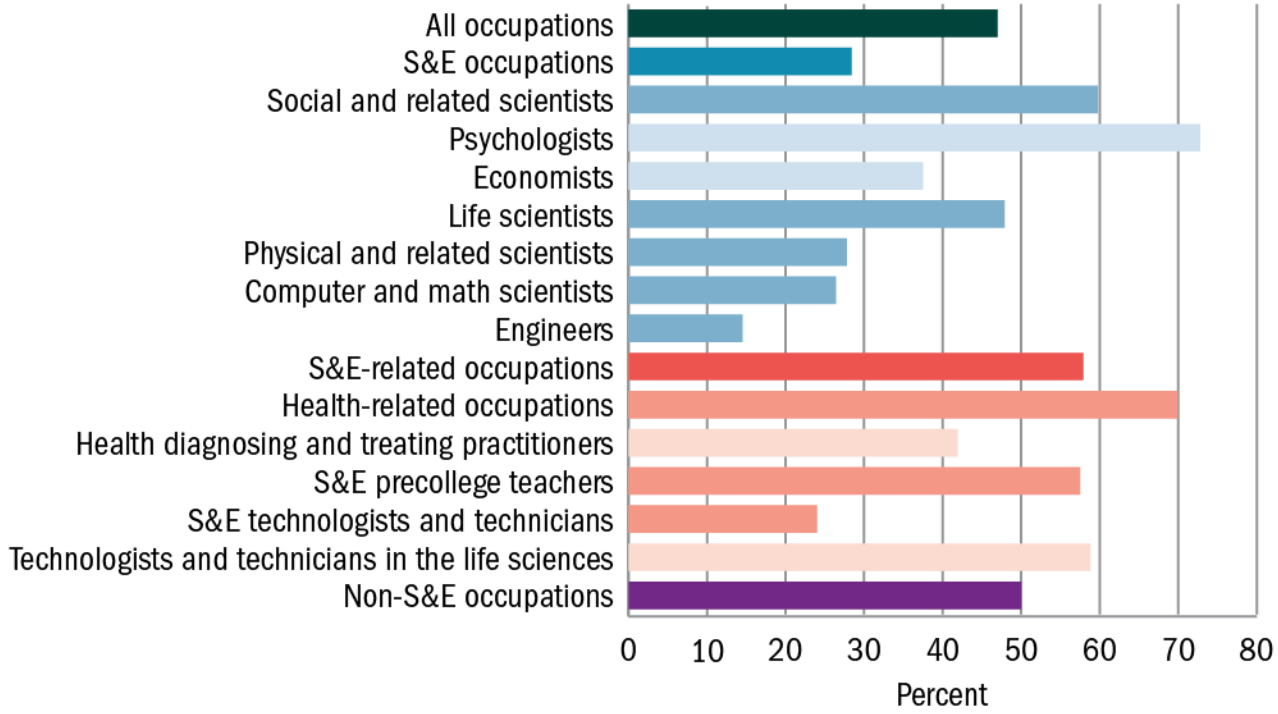
Science and engineering bachelor's degrees earned by Hispanic women, by field: 1995–2014



NOTES: Data not available for 1999. Hispanic may be any race.

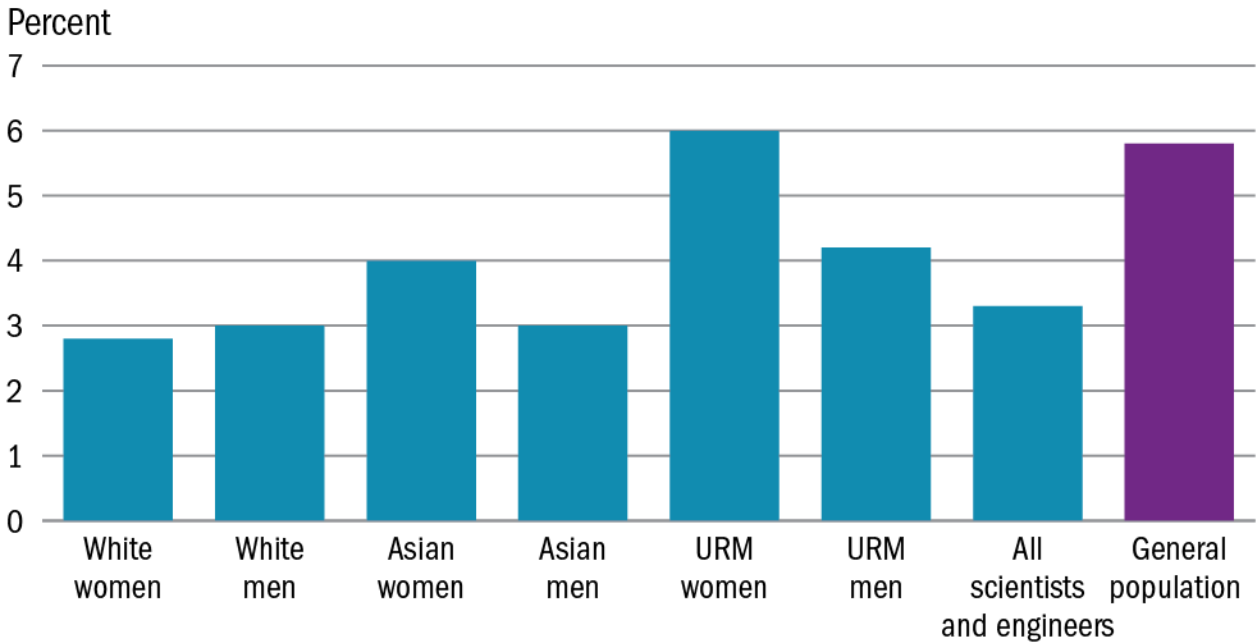
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Employed women scientists and engineers, as a percentage of selected occupations: 2015



Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Unemployment rates among scientists and engineers: 2015



URM = underrepresented minority.

NOTE: The general population consists of the U.S. civilian noninstitutional population 16 years and over.

Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

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